IN THE CLAIMS

1. (Original) Apparatus for rehabilitating a patient who has a paretic body part, the apparatus comprising:

a) at least one electromyography (EMG) sensor adapted to being applied to a voluntary muscle of a healthy body part of the same type as the paretic body part, which at least one sensor produces at least one EMG signal;

b) a neuromuscular electrical stimulation (NMES) device adapted for stimulating at least one voluntary muscle of the paretic body part;

c) a controller which controls the NMES device, said controller being configured to:

(i) store a desired motion of the paretic body part,

(ii) store NMES amplitude insufficient to cause said desired motion; and

(iii) determine an amplitude of stimulation of the paretic body part at least partly based on the EMG signal from the healthy body part and said storage such that said NMES stimulation is not sufficient, on its own, to move said paretic body part said desired motion.

2. (Original) Apparatus according to claim 1, wherein the at least one muscle of the healthy body part corresponds to the at least one muscle of the paretic body part.

3. (Original) Apparatus according to claim 1, wherein said controller is configured to process said EMG signals and determine at least one property of said NMES signal.

4. (Original) Apparatus according to claim 2, wherein the controller is configured so that the NMES stimulates the paretic body part to make a movement corresponding to a movement made by the healthy body part when the EMG signals are sensed.

5. (Original) Apparatus according to claim 4, wherein the controller is configured so that the amplitude of stimulation of at least one of the at least one muscle of the paretic body part increases when the EMG signal from the corresponding muscle of the healthy body part increases at a corresponding time in the movement of the healthy body part.

6. (Original) Apparatus according to claim 4 or claim 5, wherein the at least one muscle of the paretic body part comprises an antagonistic pair of muscles, and the controller is configured so that the amplitude of stimulation of one muscle of the antagonistic pair of muscles decreases

when the EMG signal from the muscle in the healthy body part corresponding to the other muscle of the antagonistic pair of muscles increases at a corresponding time in the movement of the healthy body part.

7. (Previously Presented) Apparatus according claim 1, wherein one or both of the controller and the NMES device are configured to store a stimulation amplitude that is not high enough to cause the stimulated muscle to contract in the absence of nerve impulses from the patient's brain, but is high enough to cause the muscle to contract in the presence of nerve impulses from the patient's brain, for at least some patients who cannot move said body part by themselves.

8. (Previously Presented) Apparatus according to claim 1, wherein the at least one EMG sensor comprises a plurality of EMG sensors, each EMG sensor adapted to being applied to a different muscle or muscle part of the healthy body part.

9. (Original) Apparatus according to claim 8, wherein each EMG sensor produces a separate EMG signal.

10. (Original) Apparatus according to claim 9, wherein the NMES device is adapted to independently stimulate a plurality of muscles or muscle parts of the paretic body part.

11. (Original) Apparatus according to claim 10, wherein said plurality of muscles or muscle parts of the paretic body part correspond to the muscles or muscle parts of the healthy body part to which the plurality of EMG sensors are adapted to being applied.

12. (Original) Apparatus according to claim 11, wherein the controller is configured so that amplitude of NMES stimulation of said plurality of muscles or muscle parts of the paretic body part is at least partly dependent on the EMG signals from the plurality of EMG sensors.

13. (Original) Apparatus according to claim 12, wherein the controller is configured so that the amplitude of NMES stimulation of each of said plurality of muscles or muscle parts depends at least partly on the EMG signal from the corresponding muscle or muscle part.

14. (Previously Presented)Apparatus according to claim 1, wherein the paretic body part is a body part that comes in pairs.

15. (Original) Apparatus according to claim 14, wherein the paretic body part is an arm.

16. (Original) Apparatus according to claim 14, wherein the paretic body part is a leg.

17. (Original) Apparatus according to any of claims 14-16, wherein the healthy body part belongs to the patient.

18. (Original) Apparatus according to any of claims 14-16, wherein the healthy body part belongs to a different person.

19. (Previously Presented)Apparatus according to claim 1, wherein the controller makes the stimulation amplitude at least partly dependent on a processed form of the EMG signal.

20. (Original) Apparatus according to claim 19, wherein the processed form of the EMG signal is stretched out in time from the EMG signal.

21. (Original) Apparatus according to claim 19 or claim 20, wherein the processed form of the EMG signal corresponds to an EMG signal that would be produced by a movement of the healthy body part that is a mirror image of a movement that the healthy part was undergoing when the EMG signal was generated.

22. (Previously Presented)Apparatus according to claim 19, wherein the processed form of the EMG signal is time delayed from the EMG signal.

23. (Previously Presented)Apparatus according to claim 1, also including a first position sensing device which monitors a position of the healthy body part.

24. (Withdrawn) Apparatus according to claim 23, also including a first actuating device which mechanically changes the position of the healthy body part.

25. (Previously Presented)Apparatus according to claim 1, also including a second position sensing device which monitors a position of the paretic body part.

26. (Withdrawn) Apparatus according to claim 1, including a paretic actuating device which mechanically changes the position of the paretic body part under control of said controller and according to said expected move.

27. (Withdrawn) Apparatus according to claim 24, wherein said first actuating device mechanically changes the position of said healthy body part at varying levels chosen from the group of complete assistance, partial assistance or no assistance.

28. (Withdrawn) Apparatus according to claim 24, wherein said first actuating device mechanically changes the position of said healthy body part by limiting the range of motion of said part.

29. (Withdrawn) Apparatus according to claim 26, wherein said second actuating device mechanically changes the position of said paretic body part at varying levels chosen from the group of complete assistance, partial assistance or no assistance.

30. (Withdrawn) Apparatus according to claim 26, wherein said second actuating device mechanically changes the position of said paretic body part by limiting the range of motion of said part.

31.-35. (Canceled)

36. (Original) A method of rehabilitating a patient who has a paretic body part, the method comprising:

a) having the patient or another person move a healthy body part that is of the same type as the paretic body part;

b) detecting EMG signals from the healthy body part while it is being moved;

c) processing said EMG signals to determine at least one property of a NMES signal;

d) applying a NMES signal to the paretic body part, responsive to said processing; and

e) moving said paretic body part at most partially by said NEMS stimulation.

37. (Original) A method according to claim 36, wherein said NMES is applied at a timing according to said EMG signals.

38. (Original) A method according to claim 36, wherein said NMES is applied at an amplitude according to said EMG signals.

39. (Original) A method according to claim 36, also including having the patient attempt to move the paretic body part, while the NMES is applied, in the same pattern of movement that the healthy body part is moved in while the EMG signals are detected.

40. (Original) A method according to claim 39, wherein detecting the EMG signals comprises detecting the EMG signals from a plurality of muscles or muscle parts of the healthy body part, and applying NMES comprises applying NMES to a plurality of muscles or muscle parts of the paretic body part corresponding to the plurality of muscles or muscle parts of the healthy body part.

41. (Original) A method according to claim 40, wherein the amplitude of NMES applied to each muscle or muscle part of the paretic body part during a time interval in the pattern of attempted movement of the paretic body part depends at least partly on the EMG signal detected from the corresponding muscle or muscle part of the healthy body, during a corresponding time interval in the pattern of movement of the healthy body part.

42. (Withdrawn) A method according to claim 36, wherein the paretic body part is mechanically provided with movement by an actuating device.

43. (Withdrawn) A method according to claim 42, wherein said actuating device is synchronized to said detected EMG.

44. (Withdrawn) A method according to claim 42, wherein said actuating device is synchronized to said applied NMES.

45. (Withdrawn) A method according to any of claims 36-44, wherein the paretic body part is mechanically assisted with movement by an actuating device.

46. (Withdrawn) A method according to claim 36, wherein movement of the paretic body part is limited by an actuating device.

47. (Previously Presented) Apparatus according to claim 1, wherein said desired motion is of an arm.

48. (Previously Presented) A method according to claim 36, wherein said paretic body part is an arm.